1)

$372 = m_1 \cdot 5! + m_2 \cdot 4! + m_3 \cdot 3! + m_4 \cdot 2! + m_5 \cdot 1! + 1$

$372 = 120m_1 + 24m_2 + 6m_3 + 2m_4 + m_5 + 1$

$371 = 120m_1 + 24m_2 + 6m_3 + 2m_4 + m_5$

371 : 120 = 3 = m_1
360

11 : 24 = 0 = m_2
0

11 : 6 = 1 = m_3
6

5 : 2 = 2 = m_4
4

1 : 1 = 1 = m_5
1

0

1^0	2^1	3^2	4^3	5^4	6^5	m
4	1	2	3	5	6	$m_1 = 3$
4	1	2	3	5	6	$m_2 = 0$
4	1	3	2	5	6	$m_3 = 1$
4	1	3	6	2	5	$m_4 = 2$
4	1	3	6	5	2	$m_5 = 1$

4 1 3 6 5 2

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2) $4638 = m_1 \cdot 6! + m_2 \cdot 5! + m_3 \cdot 4! + m_4 \cdot 3! + m_5 \cdot 2! + m_6 + 1$

$4637 = 720m_1 + 120m_2 + 24m_3 + 6m_4 + 2m_5 + m_6$

4637 : 720 = 6 = m_1
4320

317 : 120 = 2 = m_2
240

77 : 24 = 3 = m_3
72

5 : 6 = 0 = m_4
0

5 : 2 = 2 = m_5
4

1 : 1 = 1 = m_6
1

0

1^0	2^1	3^2	4^3	5^4	6^5	7^6	m
7	1	2	3	4	5	6	$m_1 = 6$
7	3	1	2	4	5	6	$m_2 = 2$
7	3	5	1	2	4	6	$m_3 = 3$
7	3	5	1	2	4	6	$m_4 = 0$
7	3	5	1	6	2	4	$m_5 = 2$
7	3	5	1	6	4	2	$m_6 = 1$

7 3 5 1 6 4 2

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3/4) 4 6 5 1 2 3

1 2 3 4 5 6

1	2	3	4	5	6	m
4	1	2	3	5	6	$m_1 = 3$
4	6	1	2	3	5	$m_2 = 4$
4	6	5	1	2	3	$m_3 = 3$
4	6	5	1	2	3	$m_4 = 0$
4	6	5	1	3	2	$m_5 = 1$

$r = 3 \cdot 5! + 4 \cdot 4! + 3 \cdot 3! + 0 \cdot 2! + 1 \cdot 1! + 1$

$r = 3 \cdot 120 + 4 \cdot 24 + 3 \cdot 6 + 1 + 1$

$r = 360 + 96 + 18 + 2$

$r = 476$

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5) 6 8 3 4 1 2 7 5

1 2 3 4 5 6 7 8

1	2	3	4	5	6	7	8	m
6	1	2	3	4	5	7	8	$m_1 = 5$
6	8	1	2	3	4	5	7	$m_2 = 6$
6	8	3	1	2	4	5	7	$m_3 = 2$
6	8	3	4	1	2	5	7	$m_4 = 2$
6	8	3	4	1	2	5	7	$m_5 = 0$
6	8	3	4	1	2	5	7	$m_6 = 0$
6	8	3	4	1	2	7	5	$m_7 = 1$

~~$r = 5 \cdot 7! + 6 \cdot 6! + 5 \cdot 2! +$~~

$r = 5 \cdot 7! + 6 \cdot 6! + 2 \cdot 5! + 2 \cdot 4! +$

$+ 0 \cdot 3! + 0 \cdot 2! + 1 \cdot 1! + 1$

$r = 5040 \cdot 5 + 720 \cdot 6 + 120 \cdot 2 + 24 \cdot 2$

$+ 2$

$r = 25200 + 4320 + 240 + 48 + 2$

$r = 29810$

8)

6 3 4 1 2 5 3 4 3 5

1 2 3 3 3 4 4 5 5 6

1	2	3	3	3	4	4	5	5	6	m
6	1	2	3	3	3	4	4	5	5	$m_1 = 9$
6	3	1	2	3	3	4	4	5	5	$m_2 = 2$
6	3	4	1	2	3	3	4	5	5	$m_3 = 4$
6	3	4	1	2	3	3	4	5	5	$m_4 = 0$
6	3	4	1	2	3	3	4	5	5	$m_5 = 0$
6	3	4	1	2	5	3	3	4	5	$m_6 = 3$
6	3	4	1	2	5	3	3	4	5	$m_7 = 0$
6	3	4	1	2	5	3	4	3	5	$m_8 = 1$
6	3	4	1	2	5	3	4	3	5	$m_9 = 0$
6	3	4	1	2	5	3	4	3	5	

$$\pi = 9 \cdot P_{3,2,2}(9) + 2 \cdot P_{3,2,2}(8) + 4 \cdot P_{2,2,2}(7) + 0 \cdot P_{2,2}(6) + 0 \cdot P_{2,2}(5) + 3 \cdot P_{2,2}(4) + 0 \cdot P_2(3) + 1 \cdot P(2) + 0 \cdot P(1) + 1$$

$$\pi = 9 \cdot \frac{9!}{3! \cdot 2! \cdot 2!} + 2 \cdot \frac{8!}{3! \cdot 2! \cdot 2!} + 4 \cdot \frac{7!}{2! \cdot 2! \cdot 2!} + 3 \cdot \frac{4!}{2! \cdot 2!} + 1 \cdot 2! + 1$$

$$\pi = 9 \cdot \frac{9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3!}{3! \cdot 2 \cdot 2} + 2 \cdot \frac{8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3!}{3! \cdot 2 \cdot 2} + 4 \cdot \frac{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2!}{2! \cdot 2 \cdot 2} + 3 \cdot \frac{4 \cdot 3 \cdot 2!}{2 \cdot 2!}$$

$$\pi = 9 \cdot 9 \cdot 8 \cdot 7 \cdot 3 \cdot 5 \cdot 2 + 2 \cdot 8 \cdot 7 \cdot 3 \cdot 5 \cdot 2 + 4 \cdot 7 \cdot 3 \cdot 5 \cdot 2 \cdot 3 + 3 \cdot 2 \cdot 3 + 2 + 1$$

$$\pi = 136080 + 3360 + 2520 + 18 + 3$$

$$\pi = 141981$$

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9)

7352215361 12

1112223355 67

1	1	1	2	2	2	3	3	5	5	6	7	m
7	1	1	1	2	2	2	3	3	5	5	6	$m_1=11$
7	3	1	1	1	2	2	2	3	5	5	6	$m_2=6$
7	3	5	1	1	1	2	2	2	3	5	6	$m_3=7$
7	3	5	2	1	1	1	2	2	3	5	6	$m_4=3$
7	3	5	2	2	1	1	1	2	3	5	6	$m_5=3$
7	3	5	2	2	1	1	1	2	3	5	6	$m_6=0$
7	3	5	2	2	1	5	1	1	2	3	6	$m_7=4$
7	3	5	2	2	1	5	3	1	1	2	6	$m_8=3$
7	3	5	2	2	1	5	3	6	1	1	2	$m_9=3$
7	3	5	2	2	1	5	3	6	1	1	2	$m_{10}=0$
7	3	5	2	2	1	5	3	6	1	1	2	$m_{11}=0$
7	3	5	2	2	1	5	3	6	1	1	2	

$$\pi = 11\cdot P_{3,3,2,2}(11) + 6\cdot P_{3,3,2,2}(10) + 7\cdot P_{3,3,2}(9) + 3\cdot P_{3,3}(8) + 3\cdot P_{3,2}(7) + 0\cdot P_3(6)$$
$$+ 4\cdot P_2(5) + 3\cdot P_2(4) + 3\cdot P_2(3) + 0\cdot P_2(2) + 0\cdot P(1) + 1$$

$$\pi = 11\cdot \frac{11!}{3!\cdot 3!\cdot 2!\cdot 2!} + 6\cdot \frac{10!}{3!\cdot 3!\cdot 2!\cdot 2!} + 7\cdot \frac{9!}{3!\cdot 3!\cdot 2!} + 3\cdot \frac{8!}{3!\cdot 3!} + 3\cdot \frac{7!}{3!\cdot 2!}$$
$$+ 4\cdot \frac{5!}{2!} + 3\cdot \frac{4!}{2!} + 3\cdot \frac{3!}{2!} + 1$$

$$\pi = 11\cdot \frac{39916800}{144} + 6\cdot \frac{3628800}{144} + 7\cdot \frac{362880}{72} + 3\cdot \frac{40320}{36} + 3\cdot \frac{5040}{18}$$
$$+ 4\cdot \frac{120}{2} + 3\cdot \frac{24}{2} + 3\cdot \frac{6}{2} + 1$$

$$\pi = 11\cdot 277200 + 6\cdot 25200 + 7\cdot 5040 + 3\cdot 1120 + 3\cdot 280 + 4\cdot 60 + 3\cdot 12$$
$$+ 3\cdot 3 + 1$$

$$\pi = 3049200 + 151200 + 35280 + 3360 + 840 + 240 + 36 + 9 + 1 = 3240166$$

$\pm 0 : 10 : 04 : 23 : 4$

10. $n=5 \quad k=3 \quad , \; n=5 \quad k=2$

$$C_5^3 \cdot C_5^2 = \frac{5!}{3!\cdot(5-3)!} \cdot \frac{5!}{2!\,(5-2)!} = \frac{5\cdot 4\cdot 3!}{3!\cdot 2!} \cdot \frac{5\cdot 4\cdot 3!}{2!\cdot 3!} = 20\cdot 20 = 400$$

11. $n=4$

$$P(4)=P(4)=4!=24$$

12. $n=10 \quad k=4$

$$\overline{V}_{10}^{4} = 10^4 = 10\,000$$

13. a) $n=30 \quad k=7$

$$V_7^{30} = \frac{30!}{(30-7)!} = \frac{30!}{23!} = \frac{30\cdot 29\cdot 28\cdot 27\cdot 26\cdot 25\cdot 24\cdot 23!}{23!} = 797\,033\,600$$

b) $n=30 \quad k=30$

$$V_{30}^{30} = \frac{30!}{(30-30)!} = \frac{30!}{0!} = \frac{30!}{1} = 30! = 265252\,859812\,191058\,636308\,480\,000\,000 \text{ – mënyra}$$

14. $n=42 \quad k=3$

$$V_3^{42} = \frac{42!}{(42-3)!} = \frac{42!}{39!} = \frac{42\cdot 41\cdot 40\cdot 39!}{39!} = 70560 \text{ – mënyra}$$

15. a) Për me gen i plotpjestueshëm me 2 duhet të mbarojë me numër çift:

$$V_4^2 = \frac{4!}{(4-2)!} = \frac{4!}{2!} = \frac{24}{2} = 12$$

$$V_4^2 = \frac{4!}{(4-2)!} = \frac{24}{2} = 12$$

$$\Rightarrow 12+12=24$$

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15.

b)

$V_3^1 = \frac{3!}{2!} = \frac{6}{2} = 3$ - numrin fillojn me 1 dhe mbarojn me 3

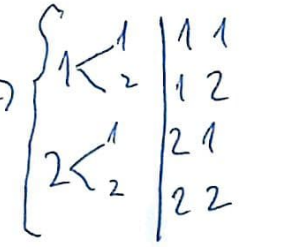
---

16. $n=15 \quad k=6$

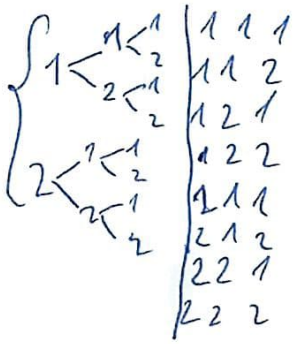
$$V_6^{15} = \frac{15!}{(15-6)!} = \frac{15!}{9!} = \frac{15 \cdot 14 \cdot 13 \cdot 12 \cdot 11 \cdot 10 \cdot \cancel{9!}}{\cancel{9!}} = 3603600$$

17.

2-shifrorë: $\bar{V}_2^2 = 2^2 = 4 \Rightarrow$



3-shifrorë: $\bar{V}_2^3 = 2^3 = 8 \Rightarrow$



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18. $n=3 \quad k=12$

$\bar{V}_3^{12} = 3^{12} = 531441$

---

19. a) $n=10 \quad k=3$

$\bar{V}_{10}^3 = 10^3 - 1 = 1000 - 1 = 999$

b) $n=10 \quad k=6$

$\bar{V}_{10}^6 = 10^6 - 1 = 1000000 - 1 = 999999$

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20.

$n = 5 \quad k = 3$

$$C_5^3 = \frac{5!}{3!(5-3)!} = \frac{5!}{3! \cdot 2!} = \frac{5 \cdot 4 \cdot 3!}{3! \cdot 2} = 10$$

21. 20-D 16-V

$$C_{20}^1 \cdot C_{16}^1 + C_{20}^2 \cdot C_{16}^2 + C_{20}^3 \cdot C_{16}^3 + C_{16}^4 =$$

$$= \frac{20!}{19!} \cdot \frac{16!}{15!} + \frac{20!}{2! \cdot 18!} \cdot \frac{16!}{2! \cdot 14!} + \frac{20!}{3! \cdot 17!} \cdot \frac{16!}{3! \cdot 13!} + \frac{16!}{4! \cdot 12!} =$$

$$= \frac{20 \cdot 19!}{19!} \cdot \frac{16 \cdot 15!}{15!} + \frac{20 \cdot 19 \cdot 18!}{2 \cdot 18!} \cdot \frac{16 \cdot 15 \cdot 14!}{2 \cdot 14!} + \frac{20 \cdot 19 \cdot 18 \cdot 17!}{6 \cdot 17!} \cdot \frac{16 \cdot 15 \cdot 14 \cdot 13!}{6 \cdot 13!} + \frac{16 \cdot 15 \cdot 14 \cdot 13 \cdot 12!}{24 \cdot 12!}$$

$$= 20 \cdot 16 + 10 \cdot 19 \cdot 8 \cdot 15 + 20 \cdot 19 \cdot 3 \cdot 560 + 1820 =$$

$$= 320 + 1900 + 1140 + 560 + 1820 =$$

$$= 320 + 22800 + 638400 + 1820 = 663340$$

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